

W. O. COFFE.
TELEGRAPH KEY.
APPLICATION FILED JAN. 11, 1904.

2 SHEETS—SHEET 1.

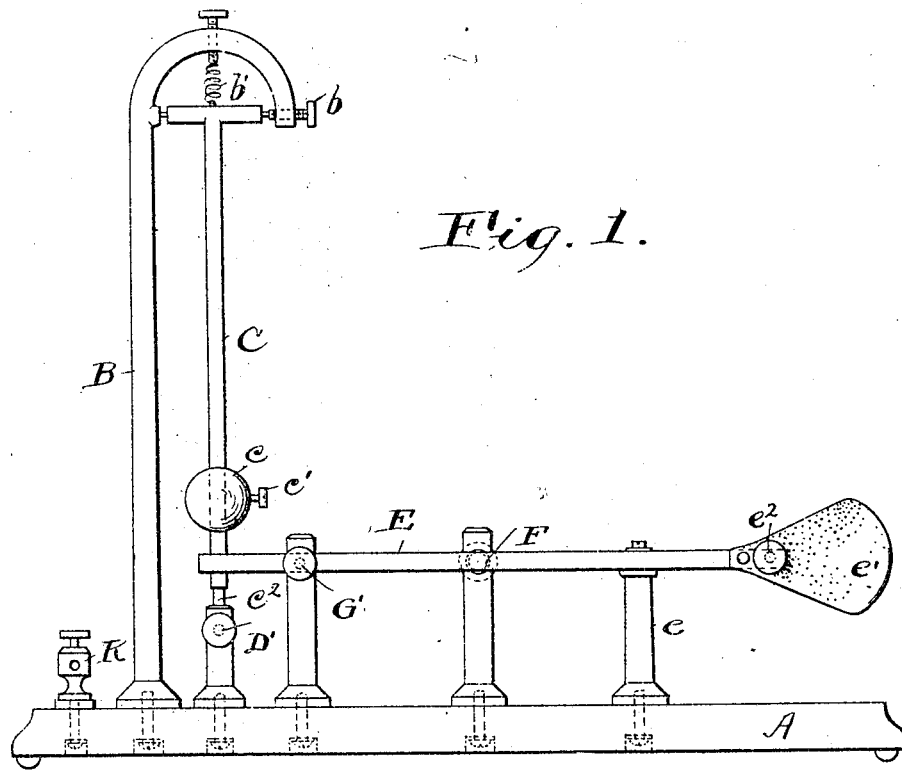


Fig. 1.

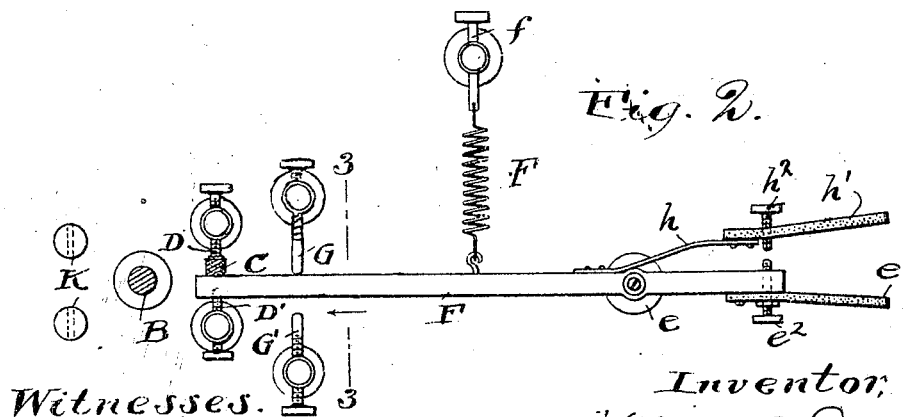


Fig. 2.

Witnesses.
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B. W. Brockitt.

Inventor,
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By his Attorneys,
Thurston & Bates.

No. 812,183

PATENTED FEB. 13, 1906.

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2 SHEETS—SHEET 2.

Fig. 3.

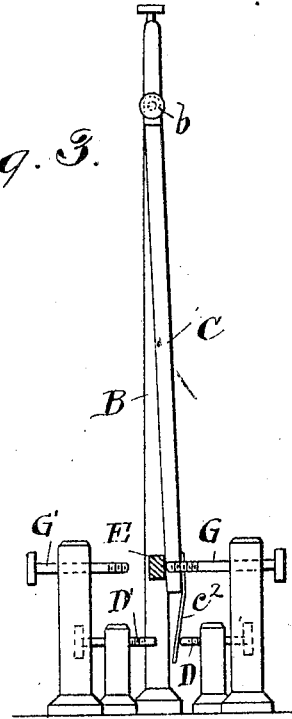
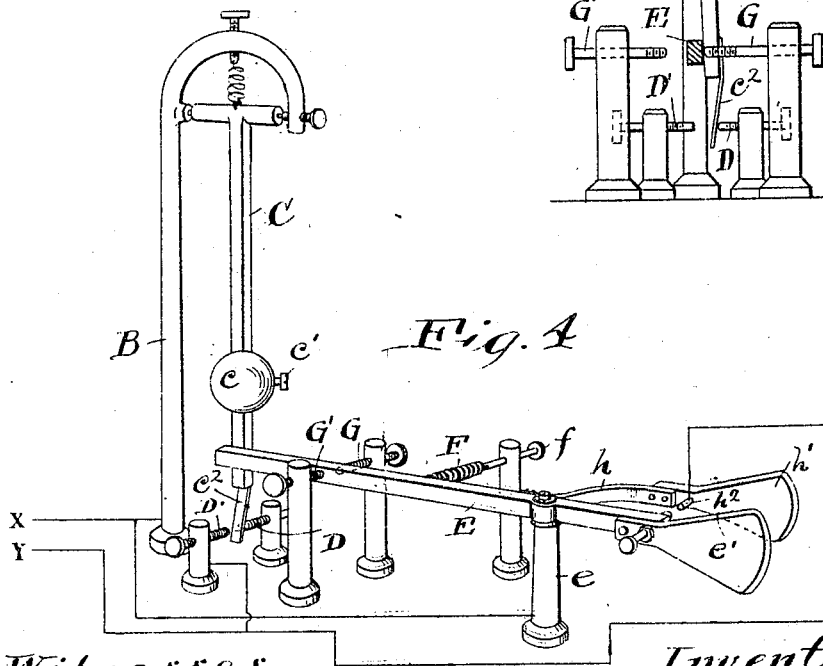


Fig. 4



Witnesses.
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UNITED STATES PATENT OFFICE.

WILLIAM O. COFFE, OF CLEVELAND, OHIO, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO BENJAMIN F. BELLOWS, OF CLEVELAND, OHIO.

TELEGRAPH-KEY.

No. 812,183.

Specification of Letters Patent.

Patented Feb. 13, 1906.

Application filed January 11, 1904. Serial No. 188,448.

To all whom it may concern:

Be it known that I, WILLIAM O. COFFE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Telegraph-Keys, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The ordinary Morse key requires a movement of the operator's hand for each dot or dash. This is extremely tiresome and wearing on the operator. To relieve the nervous strain, mechanism has heretofore been devised whereby the key is provided with two movements, one of which manually causes the dashes as usual, the other of which initiates mechanism which automatically makes the dots. Inasmuch as the dots very much preponderate in the Morse alphabet, the relief thus afforded to the operator has been demonstrated to be very great. The mechanisms heretofore used for effecting this result, however, have comprised electromagnets, batteries, switches, adjustable springs, and other features making a complex and expensive apparatus and one requiring continual adjustment as the battery runs down.

The object of this invention is to provide a mechanism to accomplish the same result while doing away with the electromagnets and batteries, the construction being at once simple, cheap, durable, and not liable to get out of order.

To this end the apparatus consists of a controller, said controller comprising a vibrator having a uniform rate of vibration and operated mechanically and adapted when released to make and break the circuit, and a key operating to release the vibrator to effect the dots, another movement being provided for the dashes.

The more particular embodiment of the invention herein shown and more fully hereinafter described is also comprised within the present invention.

In the drawings, Figure 1 is a side elevation of my improved key, and Fig. 2 is a plan thereof sectioned through the vibrator-arm and its standard. Fig. 3 is a vertical section through the key-lever, being on the line 3-3 of Fig. 2. Fig. 4 is a perspective view of the apparatus, showing the arrangement of circuits.

The same letters of reference designate the same parts in each figure.

Referring to the embodiment of parts shown in the drawings, A represents a suitable base, from which rises a standard B. Pivotaly carried by this standard is the depending vibrator-arm C. There may be an adjustable pivot-screw *b* for lightly supporting this arm and an electric conductor *b'*, connecting the arm with the standard. Slidably mounted on the arm C is shown a weight *c*, which may be clamped in adjusted position by a set-screw *c'*. At the lower end of the arm C is the leaf-spring *c''*, which projects between a pair of stop-screws D D', these screws being carried by suitable standards. In the vertical position of the vibrator or pendulum C the spring *c''* is preferably midway between the contact-points D and D'.

Fig. 4 indicates by X and Y a main line. One terminal X is connected with the standard B and the other terminal Y with the stop-screw D'. From this it results that if the spring *c''* is in contact with the stop D' the circuit is closed. If the spring is out of contact with this stop, the circuit is open.

E represents a key-lever pivotaly mounted on the standard *e*. This lever extends across and is adapted to bear against the pendulum C. It is drawn toward the pendulum by a spring F, suitably adjusted by a screw *f*. Suitable stop-screws G and G' are provided for limiting the movement of the key-lever. With the parts in normal position, as shown in the drawings, the spring F draws the key-lever to the right against the stop G, and this holds the pendulum with the leaf-spring *c''* bent against the stop-screw D. Now if the key-lever is moved away from the stop G into engagement with the stop G' the pendulum is released and swings away from the stop D and over against the stop D' under the influence of gravity, momentum, and the retractile force of the spring *c''*. This closes the circuit at D'; but the pendulum immediately returning breaks the contact, and thus causes a dot to be sent over the line. As it again swings against the stop D' another dot is sent, and so on. The length of the pendulum is such that the successive makes and breaks in the circuit which it causes shall send the succession of dots over the line at a high rate of speed. I have found a pendulum four or five inches long to be very satisfactory; but the

length varies with the stiffness of the spring c^2 and with the speed required. The sliding weight c allows variations of the effective length of the pendulum. The weight c , though desirable, is not absolutely essential, as the result could be accomplished by making the arm C heavier. The elasticity of the spring c^2 not only assists momentum, but insures the pendulum making effective contact on its successive swings. In the Morse alphabet six dots is the maximum required for any character, (six dots represent the figure "6," five dots, the letter "P;" four dots, the letter "H," these being the characters using the most dots,) and the pendulum could easily make ten or twelve dots, and so it is certain to make any number required from one to six, according to the length of time the key-lever E is held away from the stop G. The arc through which the pendulum swings is so very short that its movement is substantially uniform and the dots are made with an accuracy exceeding the best hand practice. Adjustment of the stop-screws D and D' allows the sending to be light or heavy, as desired.

For the movement of the key-lever E, I secure to it, preferably in front of its support e , a suitable wing or finger-piece e' . By means of a leaf-spring h another finger-piece h' is carried by the key-lever. These finger-pieces may be of hard rubber. The finger-piece h' carries a suitable contact-point h^2 , which is connected with the same main-line terminal Y to which the stop D' is connected. This contact-point h^2 coöperates with the contact-point e^2 , carried by the key-lever and connected by means of the key-lever and the standard e with the other main-line terminal X, which leads also to the standard B, as heretofore stated. Thus the finger-pieces e' and h' , which I term the "finger" mechanism, form another means for closing the circuit. These pieces are caused to approach each other by pressure of the operator's first finger on the piece h' whenever it is desired to make a dash, and the contact-points h^2 and e^2 contacting close the circuit for as long a period as such pressure is maintained. When the pressure is released, the spring h separates the contacts. In making the dashes, therefore, the mechanism is acted on by a pressure toward the left of the operator's first finger on the piece h' . In making the dots the whole finger mechanism is swung to the right by pressure of the thumb on the piece e' , and this releases the pendulum until the proper number of dots have been made, when their continuance is cut off by the return of the key-lever.

One of the advantages of my apparatus is that it is all contained in a single instrument. The wiring from the standards B and e and the contact-points D' and h^2 terminates in a pair of binding-posts K K, and all that is nec-

essary to do is to connect two terminals of the main line to these posts.

I claim—

1. In a telegraph-key, in combination, a gravity-vibrator adapted to swing by its own tendency and thereby make and break the circuit, a finger-key adapted to release the vibrator, and an adjacent finger-key adapted to open and close the circuit independently of the vibrator.

2. In a telegraph-transmitter, the combination of a stop and a spring coöperating therewith, each forming a terminal of an electric circuit, and a pendulum carrying one of said terminals, and means for holding said pendulum from swinging and allowing it to swing as desired.

3. In a telegraph-key, in combination, a stop, a spring coöperating therewith each forming a terminal of an electric circuit, and a pendulum carrying one of said terminals, and means for holding said pendulum from swinging and allowing it to swing as desired, a finger-piece for operating said means, and an adjacent finger-piece for closing the circuit independently of the pendulum.

4. The combination of an arm adapted to vibrate and make and break an electric contact, a key-lever engaging said arm to prevent its vibrating, a finger-piece on said key-lever for moving it to release said arm, and an adjacent finger-piece for making the contact independently of said arm.

5. The combination of a standard, a depending pendulum supported thereby, a spring carried by said pendulum and adapted to swing the same freely in both directions, an electric terminal coöperating therewith, and a key-lever adapted to control said pendulum.

6. The combination of a standard, a pendulum suspended therefrom, a spring carried by said pendulum at its lower end, a stop-screw forming an electric terminal which said spring is adapted to engage, and a key-lever adapted to bear against said pendulum and normally hold it with the spring out of contact with the stop-screw.

7. The combination of a standard, a pendulum suspended therefrom, a spring carried by said pendulum, a stop-screw forming an electric terminal which said spring is adapted to engage, a key-lever adapted to bear against said pendulum and normally hold it with the spring out of contact with the stop-screw, and a weight adjustably carried by said pendulum for varying its effective length.

8. The combination of a standard, a pendulum supported thereby and adapted to swing freely in both directions, an electric terminal coöperating therewith, and a key-lever adapted to control said pendulum, a finger-piece for operating said key-lever and an adjacent finger-piece for making dashes.

9. The combination of a pendulum, terminals coöperating therewith to make and break an electric circuit, a key-lever, and finger-pieces carried by said lever and adapted by one movement to swing the lever into engagement with said pendulum and by another movement to make and break an independent circuit.

10. The combination of a pendulum, terminals coöperating therewith to make and break an electric circuit and to transmit a rapid succession of short impulses through said circuit, and means for interrupting the movement of the pendulum, said means consisting of a key comprising a pivoted lever carrying a pair of finger-pieces, by one of which the key is given a movement to make and break another circuit.

11. In a telegraphic transmitter, in combination, a vibrator adapted to make and break an electrical circuit, a key-lever for controlling the operation of said vibrator, and an independent circuit-controller carried by said lever.

12. In a telegraphic transmitter, the combination of a vibrating controller including a spring, said spring constituting one terminal of an electric circuit, a coöperating terminal, finger mechanism adapted to be operated by the thumb and finger pressing in opposite directions, lever mechanism operatable thereby and adapted to allow the controller to vibrate and bring said terminals into contact, and a pair of contacts additional to said controller, one of said contacts being operatively connected with the finger mechanism.

13. In a telegraphic transmitter, the combination of a contact and a spring coöperating therewith, each forming a terminal of an electric circuit, a vibrating circuit-controller having a uniform rate of oscillation and carrying one of said terminals, means for holding said controller from swinging and for allowing it to swing as desired, a pair of contacts additional to said controller, and finger means for operating such allowing means and for closing said last-mentioned contacts.

14. The combination with a controller adapted to vibrate and make and break an electric circuit, a lever adapted to engage said controller and prevent its vibrating, a finger-piece movable in one direction independently of said lever, a pair of contacts independent of said controller, one of said contacts being movable and rigidly connected with said finger-piece, whereby the movement of such finger-piece may close such contacts without moving said lever, and means for moving said lever in the opposite direction to release the controller.

15. The combination of a controller adapted to vibrate and make and break an electric circuit, a lever adapted to engage said controller and prevent its vibrating, a spring acting on said lever to normally hold it in

such position, a finger-piece connected with the lever and adapted to move it away from the vibrator, a pair of contacts additional to the vibrator, and means connected with one of said contacts and movable with said lever in the direction to release the vibrator and movable independently of said lever in the opposite direction.

16. In a telegraphic transmitter, the combination of a contact and a spring coöperating therewith, each forming a terminal of an electric circuit, a vibrating circuit-controller having a uniform rate of oscillation and carrying one of said terminals, a member adapted to initiate the vibration of said controller, a spring acting on said member to hold the controller in idle position, a pair of contacts additional to said controller, and finger mechanism adapted to be operated by the thumb and finger pressing in opposite directions and serving by one of such movements to close said additional contacts and by the other to move said member to render the controller active.

17. In a telegraphic transmitter, the combination of a contact and a spring coöperating therewith, each forming a terminal of an electric circuit, a circuit-controller capable of making and breaking a circuit at a uniform rate and carrying one of said terminals, a lever normally engaging said controller to hold said spring and contact out of engagement, and means coöperating with said lever for making and breaking the circuit independently of said controller, substantially as set forth.

18. In a telegraphic transmitter, the combination of a controller adapted to vibrate and make and break a circuit, finger mechanism adapted to be operated by the thumb and finger pressing in opposite directions, a pair of contacts additional to said controller adapted to be closed by one of said pressures, and mechanism between the finger mechanism and the controller positively engaging the controller and actuatable by the opposite pressure to render said controller active.

19. In a telegraph instrument, the combination of a vibrator adapted to be held at one end and vibrate at the other and carrying a spring constituting one terminal of an electric circuit, a contact and a stop, a finger-piece and mechanism controlled thereby for normally holding said vibrator against the stop and with the contacts open but adapted to allow the vibrator to make a succession of contacts.

20. In a telegraphic transmitter, the combination of a vibrator, said vibrator carrying one terminal of an electric circuit and including a normally constrained spring, a coöperating terminal, a finger-piece, and lever mechanism operated thereby and adapted to hold the terminals out of contact with the spring constrained or to permit the vibrator

to operate and bring said terminals into contact.

21. In a telegraphic transmitter, the combination of a controller capable of vibrating and making and breaking a circuit and including a spring, a restraining-arm therefor, a spring acting on said arm to cause it to prevent the controller from vibrating, a pair of contacts independent of said controller, and finger mechanism having two movements, by one of which it closes the independent contacts, and by the other of which it moves the arm against the action of the spring to render the controller active.

22. In a telegraphic transmitter, the combination of a vibrator capable of making and breaking a circuit at a uniform rate, key-lever mechanism normally engaging said vibrator and preventing it from operating, means co-operating with said mechanism for making and breaking the circuit independently of said vibrator, said mechanism being capable of a movement to withdraw it from engagement with said vibrator, substantially as set forth.

23. In a telegraphic instrument, the combination of a vibratory controller including a spring supported at one end, a contact and a stop on opposite sides of the path of vibration of said controller, a finger-piece, and mechanism controlled thereby for normally holding said controller against the stop with the contacts open, but adapted to render it active to vibrate and make a succession of contacts.

24. In a telegraphic transmitter, the combination of a circuit-controller, finger mechanism adapted to be operated by the thumb and finger pressing in opposite directions, a pair of contacts additional to the controller adapted to be closed by one of said pressures, and mechanism between the finger mechanism and the controller positively engaging the controller and actuatable by the other of said pressures to render said controller active.

25. In a telegraphic transmitter, the combination of a circuit-controller capable of

making and breaking a circuit at a uniform rate, finger-key mechanism, a contact for said mechanism, mechanical means extending between said mechanism and said controller and normally preventing the operation of said controller, said mechanism being capable of two movements, by one of which it actuates said mechanical means to permit the operation of said controller; and by the other of which it engages its contact.

26. In a telegraphic transmitter, the combination of a circuit-controller, means for rendering said controller inactive, finger-key mechanism, a contact therefor, said mechanism being capable of two movements, by one of which it operates said means and renders the controller active, and by the other of which it is brought into operative relation with its contact.

27. In a telegraphic transmitter, the combination of a controller capable of making and breaking a circuit at a uniform rate, a pivoted arm normally preventing the operation of said controller, finger mechanism and a contact for said mechanism, said mechanism being capable of two movements, by one of which it moves the arm to permit the operation of the controller, and by the other of which it engages its contact.

28. In a telegraphic transmitter, the combination of a circuit-controller, a pivoted member, means acting on said member to hold said controller in inactive position, finger mechanism and a contact therefor, said mechanism being capable of two movements, by one of which it operates said member to render the controller active, and by the other of which it is brought into operative relation with its contact.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

WILLIAM O. COFFE.

Witnesses:

ALBERT H. BATES,
M. S. METZENBAUM.